# Recommendations

The panel recommends the following:

1. NLM should proceed with the proposed project to acquire and make available an image dataset of a complete, carefully selected male and female cadaver using the modalities of CT, MR, and photographs of cryosections. There must be a first project, and the panel believes this one to be quite appropriate. It will be a project through which standards will be developed and set for the electronic image libraries to come. It will provide a cornerstone and point of reference for future image collections which are related but extend along various conceptual axes: diseases of body parts, normal and abnormal growth and development, and dynamic temporal processes such as normal and abnormal body part motions.

   Guidelines for proceeding with this project are offered in Appendix A.

2. The NLM should support a follow-on research effort to develop methods, tools and standards for classification of anatomic image data from the Visible Human Project, so that applications may be developed which can extract, manipulate and display image subsets on the basis of organs, tissues, body systems and biologic function. NLM should support the development of object classification techniques, standards of rendering (e.g., degree of photorealism, how lit, how colored, how antialiased, etc.) for this subsequent phase of the project in which geometric representations are developed from the initial image data sets. NLM should develop detailed resource requirements based on its proposed standards, to determine the timing and feasibility of proceeding with the comprehensive object classification of the initial image data.

3.    NLM should expand upon initial image libraries composed of normal structure to encompass specialized image collections which represent related structural information, such as embryological development, normal and abnormal variations, and disease-related images. In this regard, NLM should collaborate with appropriate professional societies and other organizations to identify and pursue worthy examples of specialized image collections which have been developed by subject experts. The dissemination and use of these digital library collections should be promoted.

4.    NLM should encourage and support investigator-initiated research into methods for representing and linking spatial and textual information (and other relevant datatypes), and support efforts to introduce computer reconstructed anatomical imaging technologies into health professions curricula nationwide.

Fertile areas for grant support include:

1) Structural Informatics
2) Computer Graphics Technology as applied to biomedical images
3) Basic biomedical research applications
    a.    Developmental Biology, Embryology
    b.    Neurobiology
    c.    Cell and Tissue Biology
    d.    Molecular and supramolecular structure
4) Clinical applications
    a.    Stereotactic procedures
    b.    Radiation therapy
    c.    Anesthesiology
    d.    Radiology
    e.    Organ systems imaging
    f.    Orthopaedics

5) Center Grants for computer-based imaging
6) Program Projects
7) Instrumentation grants

5.    The NLM should develop and enhance its wide area computer network connections to provide an efficient electronic distribution mechanism for large digital files such as those encoding biomedical images. In the development phase of imaging projects, NLM should continue and enhance its connectivity to NSFnet and the research Internet. NLM should consider developing image-based applications which make use of the proposed gigabit speed National Research Network.